Operation/Reference Guide

TVM-1600

Endeleo Managed TV Distribution Hub

Endeleo Distributed Media

Last Revised: 6/26/2008

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Important Safety Markings

Markings Used In This Manual

The following symbols are used on the Endeleo TVM hardware and throughout this Installation Guide to advise you of important instructions. All maintenance must be carried out by an Endeleo trained and qualified engineer.

Voltage

This symbol (FIG. 1) warns the presence of a voltage of sufficient magnitude to cause a severe or fatal electric shock. Follow the appropriate instructions carefully to avoid the risk of injury.

FIG. 1 Voltage symbol

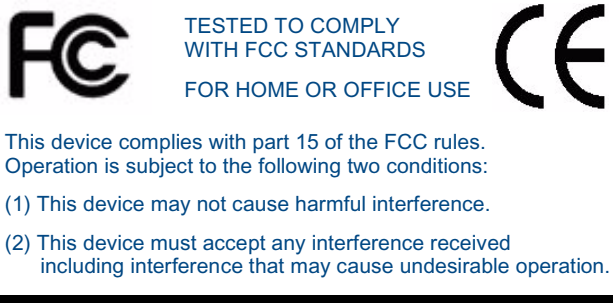
There are NO user serviceable parts within the TVM-1600.

Rating Label

The rating label, containing important safety information, is found on the bottom left of the TVM-1600 beneath the IEC connector. Symbols used on this label are explained below;

(IEC 60417-5032) The TVM Hub is suitable for Alternating current, 100 - 240V AC.

FCC (Federal Communications Commission) Standards;


TESTED TO COMPLY
WITH FCC STANDARDS
FOR HOME OR OFFICE USE
This device complies with part 15 of the FCC rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference.
(2) This device must accept any interference received
including interference that may cause undesirable operation.

Conforms to particular European Directives.

FIG. 2 Rating Label

Important Instructions

This symbol, used within this manual, indicates an important instruction for the correct and safe installation, operation or maintenance of your Endeleo TVM-1600. Failure to comply with such instruction may result in injury to person or damage to the Endeleo TVM hardware.

Compliance

FCC and IEC

Compliance with FCC and IEC standards are found within the rating label, see above.

Date of Manufacture

For US customers the date of manufacture is also found underneath the TVM-1600.

Environmental Conditions

The criteria on this page must be observed for the installation of the Endeleo TVM-1600.

Temperature

DO NOT install or operate the Endeleo TVM-1600 in an area where the ambient temperature exceeds 35ºC (95ºF) or falls below 5ºC (35ºF).

Ventilation

DO NOT obstruct the rear or side ventilation grilles during operation as this will restrict the airflow and may cause the main board to overheat.

The 16 port TVM-1600 is fitted with two cooling fans. These draw cool air through the right side ventilation grille and expel warm air through the grilles on the left side ventilation grilles.

Humidity

DO NOT install or operate the 16 port Endeleo TVM-1600 in an area in which the ambient relative humidity exceeds 85% or an area that is prone to condensation.

Water / Liquids

DO NOT install or operate the 16 port Endeleo TVM-1600 near water or in a location which may be prone to water seepage, dripping or splashing.

DO NOT place objects containing liquids on the appliance.

The TVM-1600 is not waterproof.

External use

DO NOT install or operate the TVM-1600 externally.

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Overview

The TVM-1600 Managed TV Hub is the central node of the system that converts the multi-channel RF input to user selectable video channels for distribution using the standard building infrastructure.

The TVM-1600 is available in two versions:

- The US version (**FG-TVM-1600**) is configured to work with standard US NTSC frequencies.
- The International version (**FG-TVM-1600-PSC**) is configured to work with standard PAL frequencies.

Each TVM-1600 supports 16 users and up to 192 video channels per user connection.

The input to the TVM-1600 is via an industry standard RF feed and the output is presented as an RJ45 socket for connection to the Cat5, 5e or 6 twisted pair cable.

The selected video channel is then transmitted via the UTP cable to one of Endeleo's TVM-RX03 Managed TV Receivers which can be up to 1000 metres/3000 feet away from the TVM-1600.

Multiple hubs can be chained together providing support and control to hundreds or even thousands of users/displays.

Each TVM-1600 has an Ethernet network port to provide connectivity to the central management system or can be controlled by the onboard web pages.

Front Panel

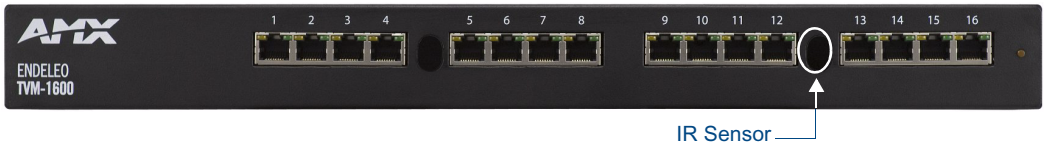

FIG. 1 TVM-1600 Front panel

The front panel has 16 RJ45's for connecting the receive units to.

RJ45 Connectors

These are standard RJ45's and the receive units can be connected using either Cat5, Cat5e or Cat 6 cabling.

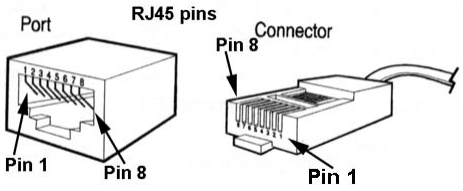

FIG. 2 RJ45 socket

The following functions are performed by each of the pins:

568B			
Pair	**Color**	**RJ45 Pin**	**Endeleo Function**
1	White/Blue Blue	5 4	Balanced Audio Left/Mono
2	White/Orange Orange	1 2	Balanced Video
3	White/Green Green	3 6	Bidirectional data
4	White/Brown Brown	7 8	Balanced Audio Right/Phantom Power

568A			
Pair	**Color**	**RJ45 Pin**	**Endeleo Function**
1	White/Blue Blue/Blue White	5 4	Balanced Audio Left/Mono
2	White/Green Green	1 2	Balanced Video
3	White/Orange Orange	3 6	Bidirectional data
4	White/Brown Brown	7 8	Balanced Audio Right/Phantom Power

IR Sensor

An IR receive port is found at the front of the TVM-1600 to the right hand side (FIG. 1). This is used to learn device IR remote control functions from devices such as DVD players, VCRs etc. Common functions learned include Power on, Power off, Play, Pause, Stop etc.

Rear Panel

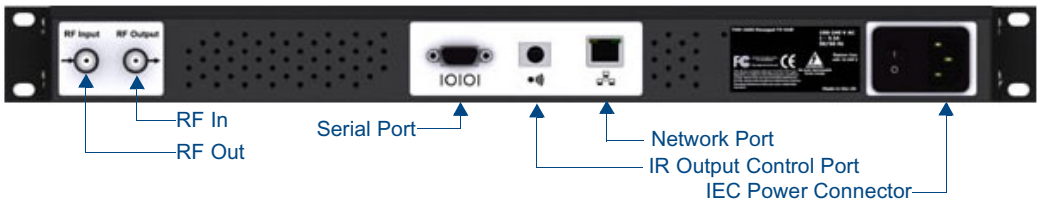

FIG. 3 TVM-1600 Rear panel

The rear panel has connectors to enable the connection of an RF feed, and enable this to be cascaded to subsequent hubs. There are also connectors for connection of a serial control device, an IR output connection for remote control of various devices (up to 4 devices supported), and a 10 baseT network connector.

RF In

Multiple TVM-1600s can be cascaded together by looping the RF feeds together.

Simply take an RF Out connection and connect it to the RF In port (FIG. 3) of the subsequent TVM-1600. The insertion loss on the RF Out connector is 3.6dB.

You can connect multiple TVM-1600s through the RF Out connector as long as the inserted feed is higher than +20dB.

Inserting a splitter before the installed TVM-1600s ensures that all TVM-1600s receive the same RF levels.

- The RF input supports input levels in the range 80-105dBµV.
- It is important that there is a maximum of 6dB variation between channels.

RF Out

Use the RF Out connection (FIG. 3) to cascade TVM-1600s together. TV Channels can now be distributed to another TVM-1600 if this connection is used with another TVM-1600 (connected to its RF In port).

Serial Port

The serial port (FIG. 3) enables an administrator to control the various functions so the TVM-1600 hardware from a command line prompt. The connector is a 9-pin female D connector designed to be used with a PC and straight-through cable.

Connecting a laptop or other computer device can be achieved using straight through (male-female) serial cable.

Serial Port		
DB-9F	**Function**	**Abbreviation**
Pin 1	*Not used*	*NC*
Pin 2	Transmit Data	TD or TX or TXD
Pin 3	Receive Data	RD or RX or RXD
Pin 4	Data Set Ready	DSR
Pin 5	Signal Ground	GND
Pin 6	Data Terminal Ready	DTR
Pin 7	*Not Used*	*NC*
Pin 8	*Not Used*	*NC*
Pin 9	*Not Used*	*NC*

IR Output Control Port

The IR output port (FIG. 3) enables centrally located hardware to be control using local IR blasters attached to the connector using a custom cable assembly.

Network Port

This is a standard 10BaseT Ethernet port (FIG. 3), enabling control of the TVM-1600 from the Managed TV software platform using UDP messaging.

IEC Power Connector

The TVM-1600 uses a universal switch-mode power supply (FIG. 3), which operates from 90-264V AC, 50/60Hz, with a power consumption of 60W.

As a Class 1 appliance the TVM-1600 should be connected to a mains supply with a protective earthing connection.

The rating label found to the bottom left of the TVM-1600, beneath the IEC connector, contains important information applicable to the TVM-1600's installation environment.

The Power On/Off switch is located beside the IEC power connector.

Installation

Rack Mounting the TVM-1600

WARNING

Exercise extreme CARE when lifting or moving the TVM-1600 within the rack to avoid injury. It is recommended that you seek the assistance of another person when rack mounting the TVM-1600.

Rack mounting brackets and screws are located in the accessories box supplied with the TVM-1600.

1. Attach the rack mounting brackets to each side of the TVM-1600 using four M4 screws for each bracket.

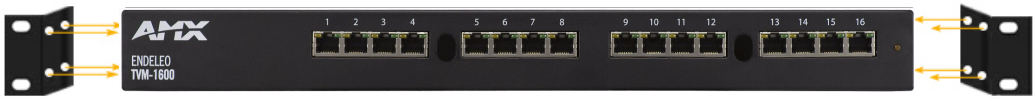

FIG. 4 Rack Mounting Brackets

WARNING

To prevent injury the TVM-1600 must be securely attached to the rack in accordance with the installation instructions.
ALWAYS use the special rack mount brackets supplied and high quality fixing screws to ensure the TVM-1600 is installed in the rack correctly.

2. Place the TVM-1600 in the rack and hold steady.
3. Two fixing holes are supplied on each side of the TVM-1600. Screw the TVM-1600 into the rack using the fixing holes.

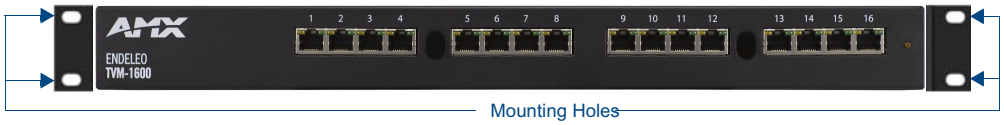

FIG. 5 Fixing Holes

WARNING

DO NOT stand other units directly on top of the TVM-1600 when it is rack mounted, as this will place excessive strain on the mounting brackets.

Ventilation

ALWAYS ensure that the rack enclosure is adequately ventilated.

Sufficient airflow must be achieved (by convection or forced-air cooling) to satisfy the ventilation requirements of all the items of equipment installed within the rack.

Connecting the Headend into the TVM-1600

To connect the Headend (TV Signals) into the TVM-1600;

1. Run the RF feed from the Headend into the TVM-1600 via the RF Input port at the rear of the TVM-1600.
2. Ensure the cable is attached correctly.
3. Power on the Headend.

Connecting the TVM-1600 to the network

Consult the Network Administrator for correct cabling from the TVM-1600 onto the network. For remote connectivity the Firewall may have to be configured to open port 2008 for remote connectivity over UDP.

The TVM-1600 will need to be connected to the network to allow Hub Management using the TVM Browser screens.

1. Connect a standard Ethernet cable to the TVM-1600's 10 BaseT port. See FIG. 3.
2. Connect the other end of the network cable to the appropriate location e.g. Network Hub, Patch Panel, Dedicated PC, etc.

Be sure to use the correct type of wire for the port. Plugging the wrong type of wire into a data or network port can cause damage to the port.

Connecting the IR blasters

The IR blasters are connected using an Endeleo TVM-IR04 (4 way IR Blaster adapter).

1. Connect the TVM-IR04 adapter to the rear of the TVM-1600 at the IR port. See FIG. 3.
2. Connect individual IR blasters to an appropriate connection on the IR adapter.
3. Run the individual IR blasters and place them on the IR sensors of the devices that they will be controlling (e.g. DVD players, VCRs etc).

Powering on the TVM-1600

To power on the TVM-1600:

As a Class 1 appliance ensure the TVM-1600 is connected to a mains socket outlet with a protective earthing connection.

1. Ensure a standard PC mains lead has been connected to the 3 pin power connection and then connected to a mains power source.
2. Flick the power switch down to its On (I) position.

Powering off the TVM-1600

NOTE

Where a mains plug (or appliance coupler) is used in the event of a fault, the TVM-1600 can be disconnected from the mains by removing the lead from the IEC inlet or from the mains socket. It is important that the TVM-1600 is installed in such a way that this method remains readily operable. The user should have easy access to either the IEC inlet or the mains socket in the event of a fault.

Flick the power switch up to its Off (0) position.

Connecting the TVM Receive Units to the TVM-1600

1. Connect a Cat5 (or appropriate cable) to a port on the TVM-1600.
2. Run the cable to the TVM-RX03 and connect at the Cat5 port.

FIG. 6 Cat5 (MTV) port on TVM-RX03

NOTE

When the TVM-1600 is powered on, an LCD illuminates on the front of the TVM-RX03.

Connecting the Receive Units to the display devices

Connect the Endeleo Receive Units to the display devices using the appropriate cables and connections;

- Video;
- Audio;
- Serial (if using a serial display device) and
- Infra-red Tx blaster, to issue IR controls to the display device e.g. power off, on etc.

Ensure a TV channel can be displayed on the display device to ensure a good connection and configuration with the TVM-1600.

Connecting the TVM-1600 to a UDM Hub

Channels available in a TVM-1600 can be distributed to a UDM Hub by interconnecting the 2 Hubs via a Cat5 port on the TVM-1600 and an A/V port on the UDM Hub.

4 standard RJ45 ports are located in an AV Inputs section to the front of the UDM Hub, labelled 1 through 4. These 4 ports are dedicated to bringing in TV feeds from the TVM-1600.

Ensure power on the TVM Ports delivering TV to the UDM Hub has been disabled on each of the TVM-1600 ports.

To connect a TVM feed into the UDM Hub, run a Cat5 cable from the relevant Port on the TVM-1600 and connect to the relevant AV Input port (1 - 4) on the UDM Hub.

Ensure AV inputs are named appropriately within the Inputs section of the Browser software. The AV inputs are named TVM-AV1 through TVM-AV4.

Hub Configuration

Overview

The TVM-1600 can be configured in a number of ways, but this manual only details configuration via the web browser.

Getting Started

1. The default IP address of the TVM-1600 Hub is **192.168.0.96**.
2. Enter the IP address into the address field within a browser window (FIG. 7).

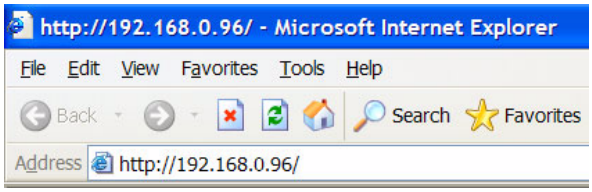

FIG. 7 Default IP address of the TVM-1600

Login

1. Upon connection to the TVM-1600, authentication (username and password) is required (FIG. 8).

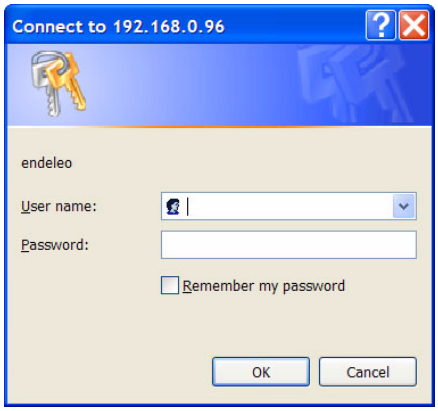

FIG. 8 Login screen

2. The username should be left blank.
3. The password is *admin*.

The password is case sensitive.

4. On initial connection the TVM-1600 **Status** page is displayed.

Network Configuration

Hubs can be configured for the network environment using the **Setup** page (FIG. 9).

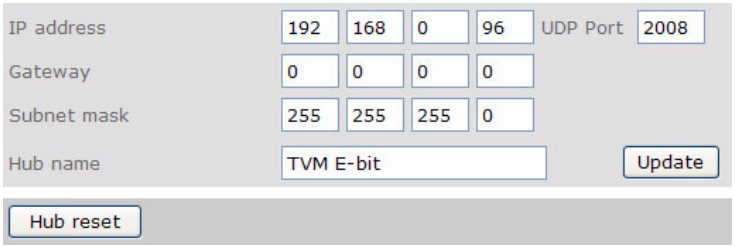

FIG. 9 Setup Page

1. Click on the **Setup** option to the left of the screen.
2. The following Hub options are configured from this page:
   - Hub IP Address, Subnet Mask and Default Gateway;
   - UDP Port (default is **2008**) and
   - Hub name (maximum of 20 characters).
3. Once the network environment has been configured click on **Update**.

NOTE

All changes are immediate - once the IP address of the TVM-1600 has been changed, redirect the web browser to the changed address.

Configuration - Channel Lineup

About Channel Lineup

In this section the Administrator will configure the TV Channels which are to be fed into the TVM-1600.

Several tasks will need to be performed;

- Name the channel;
- Configure the channel's frequency;
- Configure the TV System and
- Configure the maximum number of channels the TVM can be configured for.

From the **Status** page the Administrator is able to choose the specific TV Channel to be displayed per TVM port.

Configuring a channel Line up is performed from the **Channel Lineup** option.

NOTE

As with all configuration changes, such changes are instantaneous. There is no need to apply such changes or reboot the TVM-1600 unless directed to do so.

Configuring a Channel Lineup

The second stage of configuring the TVM-1600 is to create a channel lineup. This will associate channels / frequencies on the RF line up with channel names / numbers displayed in the TVM-1600. This is all achieved through the **Channel Lineup** page.

1. Click on the **Channel Lineup** page (FIG. 10).

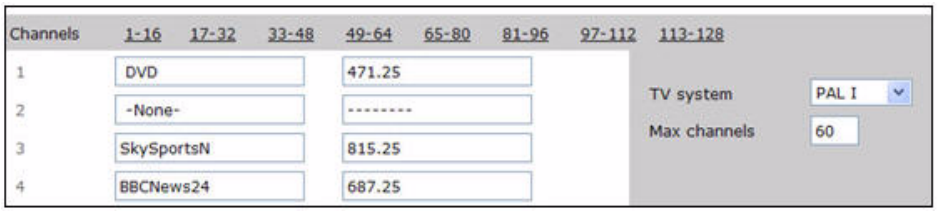

FIG. 10 The Channel Lineup Page

2. Click inside the relevant channel **name** field and name the channel appropriately - up to a maximum of **11** Characters long.

NOTE

The channel name will also be displayed on the device when that channel is chosen – this is known as On Screen Display (OSD).

3. Configure the **frequency** for the channel, e.g. 687.25 for BBC News 24.

NOTE

Frequency is measured in Megahertz (MHZ). Ensure the correct frequency is entered to avoid rogue channels.

4. Name and configure the remainder of the channels by repeating the steps above. New channels can be added in time.

Configuring the TV system

A drop down box is available on the Channel Lineup screen to set the TV standard of the incoming feed. Endeleo manufactures two types of TVM-1600;

- **NTSC** (for the US and Japanese market) and
- **Multi-format** (PAL / SECAM).

To configure the TV standard (system);

1. From the **TV System** drop down list (FIG. 11), choose the appropriate TV System e.g. NTSC M, PAL I etc. for the appropriate region.

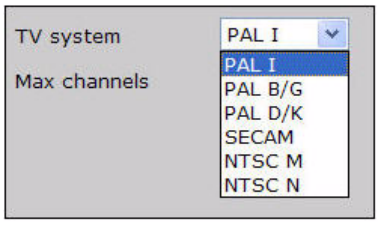

FIG. 11 Configuring the TV standard

Configuring the Maximum number of channels

The Max channels input box simply disables any channels above the number selected and avoids these being initialized as default.

To configure a maximum number of channels:

1. Click on the **Max Channels** drop down list (FIG. 12)

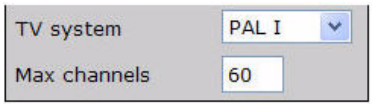

FIG. 12 Configuring the maximum number of channels

NOTE

By default, the maximum number of channels is 128, although this can be increased to 192.

2. **Type** in the maximum number of channels to be used. Channels above this number will not be visible.

Importing a channel lineup

For larger channel lineups, it is possible to import a channel lineup file previously created and stored in csv format to save on configuration time (FIG. 13).

FIG. 13 Importing a Channel Lineup

Uploading a channel lineup

As an alternative option to manually entering all channel name and frequency information you can upload a channel configuration file to the Channel Lineup web pages. This channel information can then if necessary be applied to the TVM Ports.

WARNING

Consult AMX for further information on this file.

If a configuration file exists, then:

1. Ensure the **Channel Lineup** option is selected.
2. Click on **Browse** to search for the Channel Lineup file.
3. Select the file and click **OK**.
4. Click on the **Upload Channel Lineup** option. This will populate the information for all channels listed in the file into the Channel Lineup web pages.

To Initialize (activate) ports with a channel lineup

Chose this option once all channel name and frequency information is configured. This will load the channel information to each port.

NOTE

It will take approximately 2 seconds for each channel to upload, up to five minutes in total for a complete channel/port configuration.

To initialize ports with a channel lineup:

1. Ensure the **Channel Lineup** option is selected (FIG. 13).
2. Ensure channels have been manually configured or a csv file has been imported with channel lineup information.
3. Click on **Initialize ports with lineup** to configure the TVM ports with the channel lineup.

Downloading a channel lineup

This option will save all of the channel information to a text file (.mtv extension) for backup purposes and future use.

To download a channel lineup:

1. Ensure the **Channel Lineup** option is selected (FIG. 13).

NOTE

Ensure channels have been manually configured or a csv file has been imported and ports initialized with channel lineup information.

2. Click on **Download channel lineup** to retrieve the channel lineup information.
3. When prompted choose to either open the file or save the file. Click on **Save**.
4. A default name of **data.mtv** can be used as the filename. Alternatively name the file using a recognizable name.
5. Click on **Save** to save the channel lineup file.

Configuration - User Access

About configuring User Access

Individual user ports can be configured with different access rights from the complete available channel list (FIG. 14). As with other controls via the web page, changes are instantaneously applied as they are made.

User ports on the TVM-1600 are listed across the top of the page (beneath the Channels), with channels listed down the left of page.

A green tick against a channel indicates that the user port in question will have access to this channel.

Channels above 16 are selected by clicking on the Channels link across the top of the page (1-16, 17-32, 33-48, 49-64, etc.).

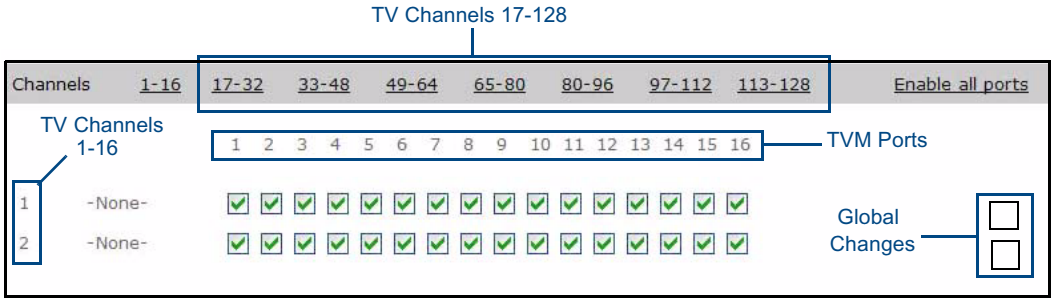

FIG. 14 Configuring User Access

Global changes can be controlled by selecting the check boxes either to the right hand side of page or along the bottom of the screen. Then click on the enable / disable all channels / ports link.

Individual configuration of TVM user ports access

To configure a TVM user port to view a channel:

1. Click on the **User Access** option.
2. Beneath the appropriate TVM user port column, **click** the tick box(es) to activate the relevant channel(s) which this port has access to. A green tick is visible – user port has access to that channel(s).
3. If necessary, click on the Channels **17-32** link or Channels **33-48** link from the top of screen to configure the same TVM user port for TV channel numbers over 16.
4. **Repeat** the process for other TVM user ports.

Global Configuration of TVM user ports

To configure a TVM user port to view multiple channels (in groups of 16):

1. Click on the **User Access** page.
2. Beneath the appropriate TVM user port column at the bottom of the screen **click** the tick box to activate the global configuration option for that User port (FIG. 15).

FIG. 15 Global Configuration

3. Now click on **Enable All Channels**, to the right of screen (FIG. 16).

FIG. 16 Enable all channels for a TVM User Port

4. **All** the tick boxes, in the column, should be ticked. The user port has access to all 16 TV channels on this page.
5. **Repeat** the process for other TVM user ports on this page.
6. **Repeat** the process for other TV channels to be configured for a TVM user port - use the Channels links at the top of screen e.g. 17-32.

Global Configuration of TV Channels

To configure a TV Channel to be viewed at all TVM user ports;

1. Click on the **User Access** option.
2. **Click** on the tick box to the far right of the channel row i.e. the global TV channel tick box (FIG. 17).

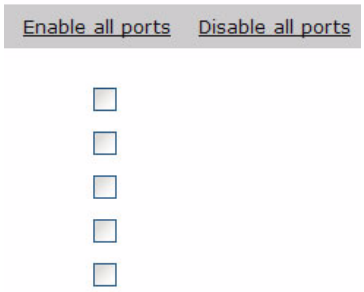

FIG. 17 Enable / Disable all ports

3. **Repeat** the process for other TVM user ports on this page.
4. Now click on **Enable All Ports**.
5. The complete channel row should be ticked. All TVM user ports will have access to the selected channel(s).
6. **Repeat** the process for other TV channels to be configured for TVM user ports on this page - use the Channel links at the top of screen e.g. 17-32 to continue giving channel access to user ports.

To Manually Disable Channels On a TVM User Port

1. Click on the **User Access** option.
2. Beneath the appropriate TVM user port column **click** the tick box(es) to remove access to the relevant TV channel(s) for this port. No green tick is visible – user port does not have access to that channel(s).
3. If necessary click on the Channels **17-32** link or Channels **33-48** link from the top of screen to disable the same TVM user port for TV channel numbers over 16.
4. **Repeat** the process for other TVM user ports.

To globally disable channels on a TVM user port

To remove all TV channels from a TVM user port;

1. Click on the **User Access** option.
2. Beneath the appropriate TVM user port column at the bottom of the screen click the tick box to activate the global configuration option for that User port (FIG. 15).
3. Now click on **Disable All Channels**, to the right of screen (FIG. 17).
4. All the tick boxes, in the column, should **not** be ticked. The user port has no access to all 16 TV channels on this page.
5. **Repeat** the process for other TVM user ports on this page.
6. **Repeat** the process for other TV channels to be disabled on TVM user ports - use the channel links at the top of screen e.g. 17-32.

To globally disable a channel from TVM user ports

To disable a TV Channel from all TVM user ports:

1. Click on the **User Access** option.
2. **Click** on the tick box to the far right of the channel row, i.e. the global TV channel tick box (FIG. 17).
3. **Repeat** the process for other TVM user ports on this page.
4. Now click on **Disable All Ports**.
5. The complete TV channel row(s) should not be ticked. All TVM user ports will not have access to the selected channel(s).
6. **Repeat** the process for other TV channels to be disabled on TVM user ports on this page - use the Channel links at the top of screen e.g. 17-32 to remove further channels from the TVM ports.

Configuration - Devices

About Device configuration

The **Device** page is for setting up and controlling 4 Back End devices. A Back end device could be a DVD player, VCR or Cable/Satellite Receiver that is modulated onto the RF feed and is connected to the rear of the TVM-1600 for distribution.

The TVM-1600 has the ability to learn the IR codes for those devices and then allow a user to control them from the TVM system. Endeleo refers to this feature as Pass-Through device control. For more information regarding Back end IR device control refer to the Advanced Administration section of this document.

Devices to be accessed in pass through mode are configured in the **Devices** option.

Naming a Device

Four remote devices can be controlled in pass through mode.

To name a device:

1. Ensure the Devices option has been selected and the Devices main page is displayed (FIG. 18). Click on the **Devices** option to the left of the screen (FIG. 18).

FIG. 18 Main Device Page

2. Click inside the relevant **name** field on the devices screen.
3. Type in the **name** of the device.

NOTE

Device names can be no more than 8 characters.

Configuring a Channel For a Device

The channel drop down box selects the channel (device) the user is switched to when pass through mode is selected from the remote control.

For example, if your DVD player is modulated on Ch 17 (Frequency of 139.25 MHz), then you must choose Ch 17 in this box for pass-through device control to work.

1. Ensure the Devices option has been selected and the Devices main page is displayed. Click on the **Devices** option to the left of the screen.
2. Click the **downward** arrow in the Channel field to reveal the list of channels which can be displayed.
3. Select the **channel** (DVD, VCR device) to be displayed when pass through mode is selected by the user.

Selecting a Device Protocol

The Protocol drop down box displays the pre-learned IR protocols for the remote devices. This is the protocol used by Device's Remote Control to power off, power on etc.

To assign a protocol to a device:

1. Click on the **Devices** option.
2. Click on the **downward arrow** in the Protocol column for the relevant device.
3. **Select** the correct protocol (previously learned) to be assigned to this device.

NOTE

For more information on IR protocol learning, refer to the Advanced Administration section of this manual.

Device Control

The bottom bar of the status page allows a limited range of Integrated Device Management instructions to be performed (FIG. 19).

FIG. 19 Bottom toolbar of the Devices page

Several commands are available, depending on which control option is selected. Some sample controls are explained below;

- **Power Off** – Sends IR or serial code associated with powering a display device off.
- **Power On** – Sends IR or serial code associated with powering a display device on.
- **A/V select** –Sends IR or serial code associated with selecting AV input on a display device.
- **Play** – play the device.

It is possible to send two commands to a device(s) using a single instruction. This is particularly useful where the display device does not return from standby into AV mode.

Issuing Controls To a Device

To issue a control to a device from the Devices page:

1. Click on the **Devices** option.
2. **Select** the Device(s) to accept the control. Use the tick box to the extreme right of screen, beneath the Include column, to select the device. The Device will highlight in orange.
3. From the **bottom** toolbar (FIG. 19), click on the drop down control list beside the 1st Control. A list of commands will be visible.
4. To execute the command for the selected Device, click on **Send To Included**.

Issuing multiple controls to a device

To issue multiple controls to a device;

1. Click on the **Devices** option.
2. **Select** the Device(s) to accept the control. Use the tick box to the extreme right of screen, beneath the Include column, to select the device. The Device will highlight in orange.
3. From the bottom toolbar click on the drop down control list beside the **1st** Control. A list of commands will be visible (power on, power off, A/V select). Select the first command to be executed.
4. From the bottom toolbar (FIG. 19) click on the drop down control list beside the **2nd** Control. A list of commands will be visible (as above). Select the second command to be executed.
5. To execute the commands for the selected Device, click on **Send to included**.

Configuration - Status Page

Port Configuration

Port configuration is accessed through the **Status** option, then clicking on the relevant port hyperlink or configuration option from the main Status screen.

NOTE

*The **Status** and **Port Control** options are almost identical – the Port control option displays a control toolbar which is used to issue controls to devices connected to TVM ports.*

For this section, we will use the **Status** option as most administration is performed from here.

NOTE

*If the Control toolbar is not visible from the Status page, click on **Port Control**.*

By default, the ports are named in numerical order starting with Port 1 through Port 16.

Port Properties

To view a port's properties:

1. Click on the **Status** option.
2. Click on the relevant **port hyperlink** e.g. Port 1.
3. The following is displayed:

- Port Version
- Port name
- Port Power
- TVM-RX03 version (if connected)
- IR remote type
- Address
- Device Port

Port version

The port controller version information is listed at the top of the page. To view a port's controller version;

1. Click on the **Status** option.
2. Click on the relevant **port hyperlink** e.g. Port 1 (FIG. 20).

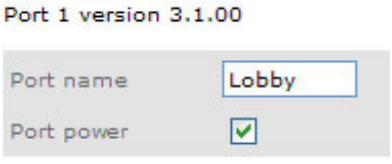

FIG. 20 Port version 3.1.00

Naming a port

1. Click on the **Status** option.
2. Click on the relevant **port hyperlink** e.g. Port 1 (FIG. 21).

FIG. 21 Naming a port

3. In the **Port name** field, type in the name of the port.

NOTE

Port names can be no more than 11 characters.

Enabling power on a port

The check box to the right of the port power option is to enable the phantom power for that port. Phantom power delivers power to the TVM-RX03 unit over the twisted pair connection.

To enable power;

1. Click on the **Status** option.
2. Click on the relevant **port hyperlink** e.g. Port 1.
3. Click the **Port Power** tick box.

NOTE

*The illuminated amber LED on the port(s) indicates that Phantom Power is enabled. Click on **Apply power** at the relevant port on the Status or Port Control screen to also enable power.*

TVM-RX03 Version

This information is available only if there is a TVM-RX03 unit connected to the port. It will provide the TVM-RX03 Type as well as the version. For information only (FIG. 22).

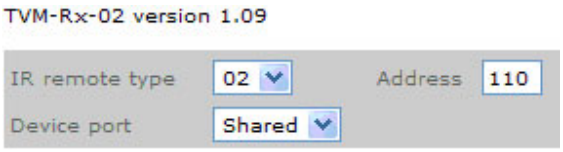

FIG. 22 TVM-MRX version

IR Remote Type

This option allows a user to set the type of remote the TVM-RX03 unit connected to this port will use. Typically an Endeleo multifunctional TVM remote is used to control this port.

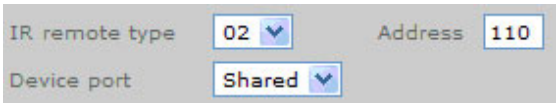

FIG. 23 Type of remote control

1. Click on the **Status** option.

2. Click on the relevant **port hyperlink** e.g. Port 1 (FIG. 23). Leave the IR remote type at 02 and address at 110.

NOTE

*By default, this is set to **IR Remote Type 2** with an **Address of 110**. Do **NOT** change unless advised to do so by AMX technical support.*

Device Port

This option is for setting what, if any, back end devices the port will have control of.

The TVM has the ability to control Back End devices such as DVD Players, VCRs or Cable/Satellite Receivers. This can be setup so that the end user can change to a channel that one of these devices is modulated on and then control that device through the TVM system.

The Devices are setup and managed from the Devices Page, which is described in Section 4 of this document.

The Device Port drop down arrow (FIG. 24) will have six listings. These listings are:

- None;
- Shared and
- 4 Named Devices (by default these are named 1, 2, 3 and 4).

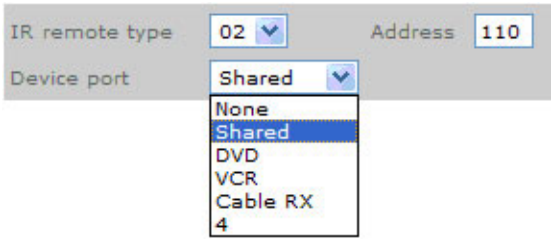

FIG. 24 Pass through Device options

No device at the TVM port

Selecting **None** will stop any pass-through back end device control for that port.

1. Click on the **Status** page.
2. Click on the **port name** hyperlink to display the port's properties.
3. From the Device Port options click on **None**. No device will be controlled at this port.

Shared

Selecting **Shared** will grant access for that port to control all devices setup on the TVM-1600.

1. Click on the **Status** page.
2. Click on the **port name** hyperlink to display the port's properties.
3. From the Device Port options click on **Shared**. All devices can be controlled at this port.

Named Device

Select any one of the named **devices** grants pass-through access to that device only.

1. Click on the **Status** page.
2. Click on the **port name** hyperlink to display the port's properties.
3. From the Device Port options click on **the required device**. Only the selected device will be controlled at this port.

Changing Channels

Changing channels by name

Each port on the TVM-1600 has a drop down box, which displays all of the channels (from the channel line up) that the TVM port has been enabled for (FIG. 25).

FIG. 25 Configuring a different channel for a port

To change channels:

1. Ensure the **Status** option has been selected.
2. From the Channel column select the (relevant TVM port) drop down Channel list to reveal the channels configured for this port.
3. Select the desired **channel** to be displayed at this port.

NOTE

Channel changes/device selection are instantaneous.

Changing channels by number

Each port on the TVM-1600 has a number column, which displays the currently configured channel that the user port is displaying.

1. Ensure the **Status** option has been selected.
2. From the Channel number column type the relevant **Channel number** to change to that channel.
3. Click **Execute** to change the channel.

Controlling Volume

To send a volume control to a display device:

1. Click on the **Status** option.
2. **Configure** the volume. For example to change the volume to 55 type in 55 beneath the Volume column in the correct TVM port.

NOTE

The maximum volume value is 63 i.e. 0 = no volume and 63 means maximum volume.

3. Once the setting has been configured, click on **Execute** to the right of screen.

Mute

To mute a device;

1. Click on the **Status** option.
2. To mute the volume click the **tick box** beneath the Mute column for the correct TVM port.

3. Once the setting has been configured click on **Execute** to the right of screen.

Locking a Port

Locking a port means the port will display only the TV channel which is configured at the web pages. There will be no human interaction permitted to change channels or volume etc. using a remote control at the **user end**.

To Lock a device:

1. Click on the **Status** option.
2. **Lock** the device. For example click the tick box beneath the Lock column for TVM port 5 to lock volume/channel changes at the user end.
3. Once the setting has been configured click on **Execute** to the right of screen.

Configuring Multiple Ports

The top bar of the status page (FIG. 26) enables global changes to be made across either all ports or those highlighted.

FIG. 26 Top toolbar of the Status page

The links (Channel Only, Volume Only) then make it possible to change the channel, the volume or perform multiple controls simultaneously (Execute all).

To configure multiple ports;

1. **Select** the ports which are to be configured by clicking on the relevant port tick boxes to the extreme right of screen. The ports are highlighted in orange.
2. From the top toolbar, configure the ports accordingly for volume, mute, lock or channel change. For example, change the volume to 45 for all ports. Alternatively, mute all the selected ports or configure the ports to display a specific TV channel.
3. Once the ports have been configured accordingly, click on the relevant hyperlink to apply the configurations:
    - **Channel only** to configure the ports for the channel setting only configured in the toolbar.
    - **Volume only** to configure the ports for the volume setting only configured in the toolbar.
    - **Execute all** to configure the ports for all the settings configured in the toolbar.

Sending Controls To a Device

Device controls can be executed from the **Status** page (FIG. 27) – as well as the Devices page.

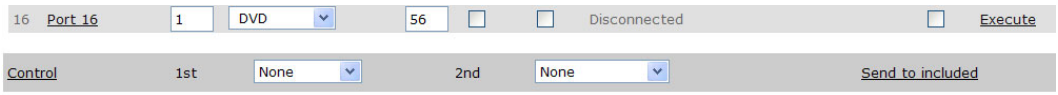

FIG. 27 Status Page controls

The Control tool bar at the bottom bar of the status page can be used to send commands to the remote device from the web pages.

Issuing primary controls to a device

WARNING

Only three commands are appropriate for Control 1; Power On, Power Off and A/V select.

To issue a first control to a device:

1. Click on the **Status** option.
2. **Select** the TVM port to where the control will be issued. Use the tick box to the extreme right of screen to select the TVM Port. The port will highlight in orange.
3. From the **bottom** toolbar click on the drop down control list beside the 1st Control. A limited list of commands will be visible (FIG. 28).

FIG. 28 Bottom toolbar (1) of the Status page

4. To execute the command for the selected TVM port click on **Send To Included**.

NOTE

Multiple ports can be selected for power on/off etc.

Issuing secondary controls to ports

When a device is already powered on, basic control functions such as Play, Stop, Pause etc. can be executed from the Status page (FIG. 29).

FIG. 29 Bottom toolbar (2) of the Status page

1. Click on the Status option.
2. **Select** the TVM port to where the control will be issued. Use the tick box to the extreme right of screen to select the TVM Port. The port will highlight in orange.
3. From the bottom toolbar click on the drop down control list beside the **2nd** Control. A list of commands will be visible. Select the second command to be executed for example Play.
4. To execute the command for the selected TVM port click on **Send To Included**.

Multiple ports can be selected for play/stop etc.

Issuing multiple controls to a device

To issue multiple controls to a device:

1. Click on the **Status** option.
2. **Select** the TVM port to where the controls will be issued. Use the tick box to the extreme right of screen to select the TVM Port. The port will highlight in orange.
3. From the bottom toolbar click on the drop down control list beside the **1st** Control. A list of commands (power on, power off, A/V select) will be visible. Select the first command to be executed e.g. **Power on**.

Only three commands are appropriate for Control 1; Power On, Power Off and A/V select.

4. From the bottom toolbar click on the drop down control list beside the **2nd** Control. A list of commands will be visible. Select the second command to be executed for example **Play**.
5. In this scenario a device (DVD player) will be powered on and instructed to play – play control issued after a 5 second delay.
6. To execute the commands for the selected TVM port(s) click on **Send To Included**.

Multiple ports can be selected for power on/off etc. and play/stop.

Configuration - Messaging

Overview

This allows an Administrator to send a basic text message across the screen of any or all ports that are selected.

NOTE

The text overlay is white with font size and color being fixed.

About Messaging

Messages can be displayed at display devices connected to the TVM-1600. The messaging interface is accessed by;

- Clicking on the **Control** link at the bottom of the screen (FIG. 30) or

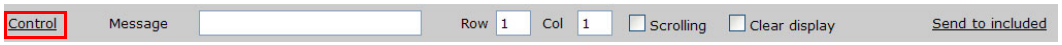

FIG. 30 Messaging toolbar on the Status page

- Clicking on the **Messaging** option from the left of the screen (FIG. 31).

FIG. 31 Messaging link on the Status page

This then loads a new tool bar enabling the creation of either fixed or scrolled messages to be placed on individual, selected or all screens.

Issuing a message

To issue a message to appear at a display device (via the TVM port);

1. Click on the **Messaging** option from the left of screen.

NOTE

*If in the **Status** screen of the management software, click on **Control** at the bottom of the screen. This will toggle between controls and messaging.*

2. **Select** the TVM port(s) which are to display the message.
3. At the bottom of the screen, a field will appear called Message (FIG. 32).

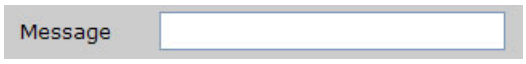

FIG. 32 Message

4. **Type** in the message which is to be displayed at the display screen.

NOTE

A maximum message size of 24 characters is permitted.

5. Specify the **start** position of the message and the **finish** position of the message on the selected screen.

The message can be placed on any of 10 rows of 20 columns.

6. Once the message has been typed in and the start and finish positions have been specified, click on **Send to included**.

Configuring multiple messages

Multiple messages can be placed in different locations on the screen, with any one of those set to be a scrolling message. Follow procedures above for each individual message.

Configuring a Scrolling message

1. Click on the **Messaging** option from the left of screen.
2. **Select** the TVM port(s) which are to display the message.
3. At the bottom of the screen, a field will appear called Message.
4. **Type** in the message which is to be displayed at the display screen.
5. Specify the **start** position of the message and the **finish** position of the message on the selected screen.
6. Click **Scrolling**, to scroll the message along the display screen.
7. Click on **Send to included** to send the message to the selected TVM ports.

Clearing messages

To remove the text from the screen;

1. Click on the **Messaging** option from the left of screen.
2. **Select** the TVM port(s) which are to have the message cleared from the display.
3. At the bottom of the screen a field will appear called Message. Delete the message in this field.
4. Click on the **Clear Display** tick box.
5. Click on **Send to included** to clear the message from the selected TVM ports.

IR Learning and IR Device Control

Overview

The Endeleo Managed TV solution supports the learning of the Infrared (IR) control protocols of the end display devices. For example it is possible from the TVM-1600 hardware to issue a remote IR request and place the screen in standby, or switch to an alternative AV input.

NOTE

When used in conjunction with the Endeleo Managed TV Server software these events can be scheduled to occur at predetermined times / dates.

These devices can be DVD players, VCRs or Cable / Satellite Receivers. For example it is possible from an end point to issue a remote IR request and select the “Play” function on a remotely located DVD player.

An IR01 IR Emitter Module is then connected to the TVM-RX03 and attached to the TV screen over its IR sensor to accept IR commands from the TVM-RX03.

Important Notes About IR Learning

- The IR learning is carried out at the TVM-1600.
- Once learned, the IR protocol is stored on the ***receive unit*** **(TVM-RX03)**. Care should therefore be taken when moving receive units between different display devices.
- Shield the TVM-1600 from other IR devices during the learning process.

Components Needed For IR Learning

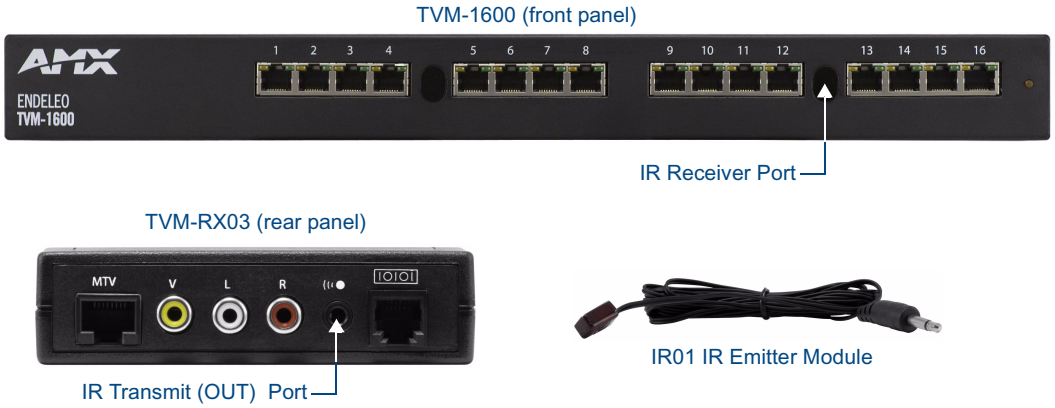

FIG. 33 Components Needed For IR Learning

Performing IR Learning

The two stages for learning IR Protocols are:

1. Train the TVM-1600 to understand the timing sequences of the remote control protocol.
2. Learn the IR code for specific functions on that remote control.

Learning the Device's IR Protocol

1. A console session needs to be opened on the TVM-1600. The configuration settings for the Terminal session are:

   - **Baud Rate:** 9600 bps
   - **Data Bits:** 8
   - **Parity:** None
   - **Stop Bits:** 1
   - **Flow Control:** None

2. At the command prompt enter the following;

   `r init hub "XXXX"`

   Where **XXXX** is the name used to identify the IR File (i.e. the device's IR File).
   For example, **r init hub "dvd"**.

*The name **dvd** will appear in the drop down boxes in the device control web page on the TVM-1600 as a protocol.*

3. Push **Enter** to execute the command. The process will then guide you through what to do;

   Point the remote control at the IR port (*right window only*) on the front of the TVM-1600 and press any key on the remote when prompted.

   When you are prompted to **press** a key, press the same key each time you are prompted. This enables the IR learning process to sample the repeat sequence used by the device.

   The system will now interpret the protocol used by the end device and the associated timings of the protocol.

   An IR initialization **complete** statement will be delivered once the TVM-1600 has successfully completed the IR learning process (FIG. 34).

```
- r init hub "dvd"
init ir for hub (17)
press key on remote control ...
press key again ...
press AND HOLD same key ...
full repeat
release key
press key again ...
press key last time ...
storing ..................... complete
-
```

FIG. 34 Configuring User Access

Learning the Device's Control Functions

To learn a device's control functions (i.e. *play*, *stop*, *pause* etc.):

1. Ensure a console session has been opened on the TVM-1600.

   The configuration settings for the Terminal session are:

   - **Baud Rate:** 9600 bps
   - **Data Bits:** 8
   - **Parity:** None
   - **Stop Bits:** 1
   - **Flow Control:** None

2. **Login** to the TVM-1600.
3. At the command prompt enter the following;

   r xx hub

   XX is the IR code.

   For example, if learning commands for a DVD player, you might want to learn include Play, Pause and Stop.

   The commands that would need to be entered are below;

   - **For Power off:** 12 hub
   - **For Play:** 70 hub
   - **For Pause:** 71 hub
   - **For Stop:** 72 hub

4. Push **Enter** to execute the command. The process will then guide you through what to do;

   Point the remote control at the IR port (*right window only*) on the front of the TVM-1600 and press the appropriate key e.g. power off from the remote when prompted (FIG. 35).

```
-
- r 12 hub
ir for command 12 (17)
press key on remote control ...
storing data  complete
press key again ...
storing data  complete
- -
```

FIG. 35 Configuring the Power off control function

Continue to enter **commands** for the device i.e. when the previous command has been learned type in **r xx hub** (where **XX** is the IR code from the *Endeleo IR Codes table* to learn another command.

See the *Endeleo IR Codes* section on page 51.

The TVM-1600 can save up to 8 commands for each device.

Again, point the remote control at the IR port (Right Window Only) on the front of the TVM-1600 and press the appropriate key, e.g. power on this time from the remote when prompted.

Saving the IR File To a PC

AMX advises you create a folder to save your IR Files in and change to that directory in the command prompt.

Once an IR protocol has been learned for a specific device, it can be saved across the network to a PC using the tftp command.

To save the IR file;

1. Open a command prompt on the PC and navigate to where the IR files are to be stored.
2. At the command prompt, use the following command;

```
tftp -i [ip address of hub] get irtable.hub
```

```
C:\IR_Tables>tftp -i 192.168.1.200 get idvd.hub_
```

FIG. 36 Saving the IR control functions to a PC

Where *irtable* is the user defined name given to the IR File (e.g. *dvd*).
This file must be in the form *iXXXX.hub*, where the "**i**" indicates it is an IR protocol file and the **XXXX** is the name, created previously.

NOTE

This file will contain all IR protocols programmed to the TVM-1600.

3. Upon completion, a successful transfer message is displayed (FIG. 37).

```
C:\IR_Tables>tftp -i 192.168.1.200 get itable.hub
Transfer successful: 240 bytes in 1 second, 240 bytes/s
```

FIG. 37 Successful transfer to a PC

4. If unsuccessful, an error is displayed, e.g. transfer Timeout occurred (FIG. 38). An error caused by a network communication issue between the TVM-1600 and the users PC may have occurred.

```
C:\IR_Tables>tftp -i 192.168.1.200 get itable.hub
Timeout occurred
```

FIG. 38 An unsuccessful IR transfer to the PC

Loading an IR File To a TVM-1600

Previously saved IR Files on a PC can be uploaded to the TVM-1600;

1. At the command prompt on the PC, navigate to the location where the IR File is saved (FIG. 39).
2. Enter the following command:

```
tftp -i [IP address of hub] put [name of ir table].hub
```

```
C:\IR_Tables>tftp -i 192.168.1.200 put idvd.hub
```

FIG. 39 Putting an IR File on the TVM-1600

3. Push **Enter** to execute the command.
4. Upon completion a successful transfer message is displayed (FIG. 40).

```
C:\IR_Tables>tftp -i 192.168.1.200 put idvd.hub
Transfer successful: 240 bytes in 1 second, 240 bytes/s
```

FIG. 40 Successful transfer of IR File

Display Device IR Control

The Endeleo Managed TV solution supports the learning of the IR control protocols for display devices (e.g. CRT TV, LCD, Plasma, Projector).

An IR Blaster is connected to the TVM-RX03 and attached to the TV screen over its IR sensor to accept IR commands from the Endeleo RX.

Important Notes About IR Control

- All devices requiring IR control must be connected to the TVM-1600 via the IR blaster port on the rear of the TVM-1600.
- The part number for the 4-Way IR Splitter necessary for TVM Central Device Control is TVM-IR04.

Configuring a Display Device's IR protocol

The two stages for learning IR Protocols are:

1. Train the TVM-RX03 to understand the timing sequences of the display device remote control protocol.
2. Learn the actual IR code for specific functions on the device's remote control e.g. power off.

Learning the IR Protocol Used By the Display Device

1. Ensure a console session has been opened on the TVM-1600. The configuration settings for the Terminal session are:

   - **Baud Rate:** 9600 bps
   - **Data Bits:** 8
   - **Parity:** None
   - **Stop Bits:** 1
   - **Flow Control:** None

2. A TVM-RX03 unit needs to be connected to port **one** of the TVM-1600.

3. At the command prompt enter the following command:

   r init X

   Where X is the port number that the TVM-RX03 unit is attached to.
   It can be a value from 1 to 16.

4. Push **Enter** to execute the command. The process will then guide you through what to do;

   Point the remote control at the IR port (Right Window Only) on the front of the TVM-1600 and press any key on the remote when prompted.
   When you are prompted to **Press** a key, press the same key each time you are prompted. This enables the IR learning process to sample the repeat sequence used by the device.
   The system will now interpret the protocol used by the end device and the associated timings of the protocol.
   An IR initialization **complete** statement will be delivered once the TVM-1600 has successfully completed the IR learning process.
   Example: **r init 1** will initialize the TVM-RX03 unit attached to port 1 for IR control of a display device. The image below shows this example in a terminal session (FIG. 41).

```
- r init 1
TVM-Rx-02 01.09
init ir for port 1
press key on remote control ...
press key again ...
press AND HOLD same key ...
full repeat
release key
press key again ...
press key last time ...
storing ............. complete
-
```

FIG. 41 Initialize RX on port 1 for IR control

Learning Specific Control Functions of a Device's Remote Control

To learn a device's control functions (i.e. play, stop, pause etc.;

1. Ensure a console session has been opened on the TVM-1600. The configuration settings for the Terminal session are:

   - **Baud Rate:** 9600 bps
   - **Data Bits:** 8
   - **Parity:** None
   - **Stop Bits:** 1
   - **Flow Control:** None

2. At the command prompt enter the following;

   r xx Y (where XX is the IR code from the table in *Appendix A – Endeleo IR codes* section on page 41) and Y is the port number of the receive unit.
   For example, if learning commands for a display device you might want to learn Power On, Power Off at port 1 of the TVM-1600. The commands that would need to be entered are below;

   - **For Power On:** 21 1
   - **For Power Off:** 12 1

3. Push **Enter** to execute the command. The process will then guide you through what to do;

   Point the remote control at the IR port (Right Window Only) on the front of the TVM-1600 and press the appropriate key e.g. power off from the remote when prompted.
   Continue to enter commands for the device (FIG. 42).
   ***Example**: "**r 12 1"** will learn the Power Off function of the TV from the remote control to the TVM-RX03 unit attached to port 1. Upon hitting enter aim the remote control of the TV at the TVM-1600 and press the "Power Off" button when prompted.*

```
-
- r 12 1
TVM-Rx-02 01.09
ir for command 12 (1)
press key on remote control ...
storing data . complete
press key again ...
storing data . complete
-
```

The 01.09 is the firmware version of the TVM-RX02 unit.

The number in parentheses (1) represents the port this function is being learned to.

FIG. 42 Learning the Power off IR command

Saving the IR File to your PC

Once an IR protocol has been learned for a specific port it can simply be copied to a PC, then copied across the network to other ports using the tftp command.

NOTE

AMX advises you create a folder in which to save your IR Files, and change to that directory in the command prompt.

To save the IR file;

1. Open a command prompt.
2. At the command prompt type the following command;

   `tftp -i [IP address of hub] get iname.port number`

   iname is the user-defined name given to this IR device
   The port number suffix relates to the port number (e.g. "**.001"** is for port 1, "**.016**" for port 16, where the IR file is stored).

NOTE

When naming an IR file, the file must always start with the letter "i", to signify that this is an IR protocol.

A sample command for an IR device name "*iSonyLCD*" on port 1 is listed below (FIG. 43).

`tftp -i 192.168.1.200 get iSonyLCD.001`

```
C:\IR_Tables>tftp -i 192.168.1.200 get iSonyLCD.001_
```

FIG. 43 Saving the IR commands

3. Upon completion, a successful transfer message is displayed (FIG. 44).

```
C:\IR_Tables>tftp -i 192.168.1.200 get iSonyLCD.001
Transfer successful: 222 bytes in 9 seconds, 24 bytes/s
```

FIG. 44 Successfully saved IR commands

Loading a Previously Saved IR File

Previously saved IR Files can be uploaded to the TVM-1600;

1. At the command prompt, navigate to the location where the IR File is saved.
2. Enter the following command to put the file on a port on the TVM-1600 (FIG. 45):

   `tftp -i [IP address of hub] put [name of ir table].XXX`

   Where **XXX** is the port number the TVM-RX03 is connected to.

```
C:\IR_Tables>tftp -i 192.168.1.200 put iSonyLCD.001_
```

FIG. 45 Loading the iSonyLCD protocol to port 1

3. Upon completion a successful transfer message is displayed (FIG. 46).

```
C:\IR_Tables>tftp -i 192.168.1.200 put iSonyLCD.001
Transfer successful: 222 bytes in 13 seconds, 17 bytes/s
```

FIG. 46 Successfully loaded the iSonyLCD protocol to port 1

Copying an IR File For Uploading To Different TVM-RX03s

It may be necessary to copy the file *iXXX.001* to other files named *iXXX.002* through *iXXX.016* in order to upload the IR files to TVM-RX03 units on all ports of the TVM-1600.

For example, if you used tftp to get an IR file from a TVM-RX03 unit on port 1, your file will have a .001 file extension.

To send this file to a TVM-RX03 on port 16 it would need a file extension of .016.

To copy an IR File to different TVM ports;

1. At the command prompt on the PC navigate to where the IR File is saved.
2. Use the Copy command (FIG. 47) to copy the IR files to different extensions;

   `copy iXXX.001 iXXX.016 <enter>`

   XXX is the file name of the IR File (e.g. *iSonyLCD*)
   .001 represents the port number of the TVM-1600, where the IR File resides.
   - and -
   XXX is the file name of the IR File (e.g. *iSonyLCD*)
   .016 represents the port number where the IR protocol is to be **copied** to on the TVM-1600.

```
C:\IR_Tables>copy iSonyLCD.001 iSonyLCD.016
```

FIG. 47 Copying the iSony LCD protocol from port 1 to port 16

3. Upon completion a successful transfer message is displayed (FIG. 48).

```
C:\IR_Tables>copy iSonyLCD.001 iSonyLCD.016
        1 file(s) copied.
```

FIG. 48 Successful copy of IR protocol from port 1 to port 16

Uploading the IR protocol to a TVM-RX03

To upload this IR file to a TVM-RX03 unit on port 16 of the TVM-1600, now use the tftp command with the new file *iSonyLCD.016*.

1. Open a command session.
2. Type in the following command;

```
tftp -i 192.168.1.200 put isonylcd.016
```

3. Push **Enter** to execute the command.

Serial Device Control

Overview

The Endeleo Managed TV solution supports the learning of serial commands for display devices. For example it is possible to turn a TV, LCD or Plasma on and off from the TVM-1600 over a serial connection.

This section describes how to learn the Serial Protocols for the TV screen and save it to the TVM-RX03 Managed TV Receiver. An RS232 cable is then connected to the TVM-RX03 and attached to the TV screen's RS232 control port.

Important Notes About Serial Device Control

- The serial commands learned are stored on the receive unit.
- Care should be taken when moving receive units between different end devices, as commands stored in one RX may be different to those in another RX.

Components Needed For Serial Device Control

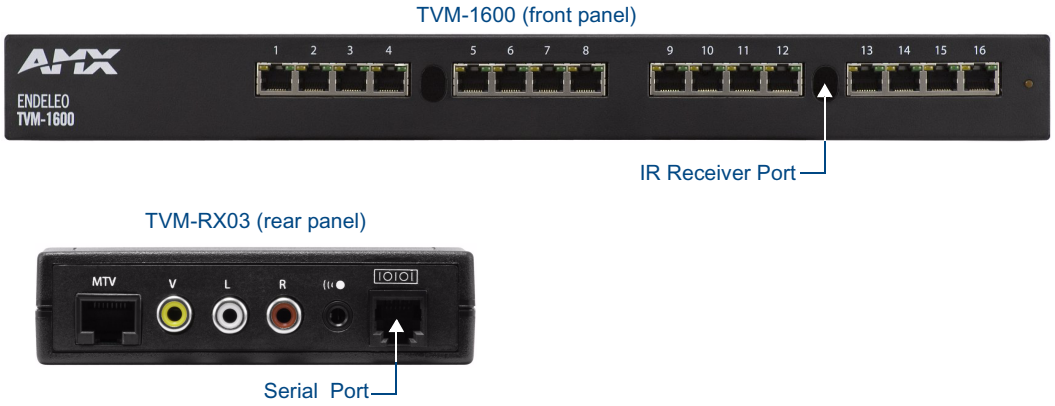

FIG. 49 Components Needed For Serial Device Control

Configuration

A console session needs to be opened on the TVM-1600, and a TVM-RX03 unit connected to any port from 1 through 16 on the TVM-1600. Console settings are as follows:

- **Baud Rate:** 9600 bps
- **Data Bits:** 8
- **Parity:** None
- **Stop Bits:** 1
- **Flow Control:** None

The two stages for learning Serial Protocols are:

1. Initialize the TVM-RX03 for serial code learning and the device's baud rate
2. Learn the serial code for specific functions for the display device

Initializing the TVM-RX03 For Serial Control and Display Device's Baud Rate

1. A console session needs to be opened on the TVM-1600. The configuration settings for the Terminal session are:

   - **Baud Rate:** 9600 bps
   - **Data Bits:** 8
   - **Parity:** None
   - **Stop Bits:** 1
   - **Flow Control:** None

2. At the command prompt enter the following command:

   r serial X (Baud Rate)
   Where **X** is the port number the TVM-RX03 unit is attached to.

   - The baud rate should be the value specified by the device manufacturer.
   - Entering the baud rate is optional, and if no baud rate is entered then the default is **9600** bits per second.
   - Baud rates of *1200*, *2400*, *4800*, *9600*, and *19200* bps are supported.

3. FIG. 50 shows the terminal session when initializing an RX for serial control.

   The command below initialized the TVM-RX03 unit attached to port 1 with a Baud Rate of 9600 bps.

```
- r serial 1 9600
initialise remote serial operation on port 1
-
```

FIG. 50 Initialize serial control on port 1

4. Once the port has been initialized for serial control, it is then necessary to associate commands available via its serial port with the Managed TV codes. Learning the command is achieved using the following command

   r "aaaaaaaa" XX Y

   - **aaaaaaaa** is the serial command string,
   - **XX** is the function code from *Appendix A – Endeleo IR codes* section on page 41
   - **Y** is the port number of the TVM-RX03 unit to be programmed e.g. r "PwrOff" 12 1.

5. Obviously, certain ASCII characters cannot be simply typed in and these can be entered into the serial string enclosed in brackets: **< >** (see *Appendix B – ASCII Control Set* section on page 43). For example [CR] is <13>, [LF] is <10>, so the same command above with a carriage return and line feed and associating the command to switch the end device into standby mode would be entered as follows:

   r "aaaaaaaa<13><10>" 12 1

   ***Example**: To learn the ASCII serial command for Power Off (ka 1 0) for an LG LCD screen, use the command below. Notice the carriage return and line feed added below.*

   r "ka 1 0<13><10>" 12 1

   This command is shown from the terminal session in FIG. 51.

```
- r "ka 1 0<13><10>" 12 1
sending data to port 1 ... complete
-
```

FIG. 51 Successful sent serial string to port 1

6. Continue entering the serial commands for the functions you want to control on the display device from the TVM system.

Hexadecimal Control Codes

NOTE

All Hexadecimal control codes should be converted to their Decimal equivalent and placed in brackets.

For example, if the serial code to power off an NEC Plasma (**02 03 00 0E**) was being learned you would need to enter the serial string as shown below.

```
r "<02><03><00><14><13><10>" 12 1
```

NOTE

A Carriage Return and Line Feed were added at the end of the serial string; <13><10>. An ASCII character table, complete with Hexadecimal and Decimal codes, can be found in Appendix B – ASCII Control Set section on page 43.

Notice that instead of entering <0E>, the example shows <**14**>, where 14 is the decimal value equivalent for the hexadecimal value of 0E (FIG. 52).

```
-
- r "<02><03><00><14><13><10>" 12 1
sending data to port 1 .. complete
-
```

Correct

```
-
- r "<02><03><00><0E><13><10>" 12 1
sending data to port 1 .. complete
-
```

Incorrect

FIG. 52 Correct vs Incorrect serial strings

NOTE

*Once the serial commands are learned, the TVM-RX03 unit is now configured for that screen type **only**.*

Saving The Serial File To a PC

The serial protocol is stored on the receive unit and rather than repeat the above process, it is possible to copy (get) a serial control table from one receive unit to others across the network.

1. To capture the serial control table, use the following command (FIG. 53);

   `tftp -i [Hub IP Address] get sname.001`

   Where **sname** is a user-defined name for the serial file, as long as it starts with an "s" e.g. sSonyLCD.001.
   The file extension is the port number the TVM-RX03 is connected to. Port 1 is .001 through port 16, which is .016.

```
C:\SR_Tables>tftp -i 192.168.1.200 get sLGLCD.001_
```

FIG. 53 Saving the serial file

2. After hitting enter, the *Transfer Successful* message (FIG. 54) is returned.

```
C:\SR_Tables>tftp -i 192.168.1.200 get sLGLCD.001
Transfer successful: 222 bytes in 9 seconds, 24 bytes/s
```

FIG. 54 Successful transfer of serial file

Copying a Serial Table For Uploading To Different TVM-RX03s

It may be necessary to copy the file sXXX.001 to other files named sXXX.002 through sXXX.016 in order to upload the serial files to TVM-RX03 units on all ports of the TVM-1600.

For example, if you used tftp to get a serial file from a TVM-RX03 unit on port 1, your file will have a .001 file extension. To send this file to a TVM-RX03 on port 16 it would need a file extension of .016.

1. Use the Copy command (FIG. 55) to copy the serial files to different extensions on the PC;

   `copy sXXX.001 sXXX.016 <enter>`

   XXX is the file name of the Serial table (e.g. *sSonyLCD.001*)
   .001 represents the port number of the TVM-1600.

```
C:\IR_Tables>copy sSonyLCD.001 sSonyLCD.016_
```

FIG. 55 Copying a serial file

2. Upon completion, a successful copy message is displayed (FIG. 56). The copied file can be uploaded (put) onto other RXs.

```
C:\IR_Tables>copy sSonyLCD.001 sSonyLCD.016
        1 file(s) copied.
```

FIG. 56 Successful copy of serial file

3. To upload (put) this Serial file to a TVM-RX03 unit on port 16 of the TVM-1600 use the tftp command with the new file sSonyLCD.016. The command is shown below;

   `tftp -i 192.168.1.200 put sSonyLCD.016`

4. Push **Enter** to execute the command.

Terminal Commands

WARNING

All administration and configuration should be performed from the TVM Web Browser.
Only if directed by AMX support should the command line be used. Inappropriate use of the command line may result in misconfigurations.

The TVM-1600 includes a serial console port and accepts some text based commands at that port – some of these commands are described below.

In all cases the serial parser will accept any command beginning with the right letter, c and channel, for example, are equivalent.

Terminal Commands	
Select Channel	Selects the channel on the ports specified by the Port property, or if non zero, the port specified in the command. `c [channel] [port]`
Restore Last Selected Channel	Selects the last channel (i.e. the one selected before the current selection) on the ports specified by the Port property, or if non zero, the port specified in the command. `b [port]`
Set Port Volume	Selects the audio volume for the ports specified by the Port property, or if non zero, the port specified in the command. If the volume parameter is not specified then the Volume property is used. `a [volume] [port]`
Lock Port	Locks the port (or range of ports) specified by the Port property, or if non zero, the port specified in the command, so that a user may no longer change channel, adjust volume etc. on that port. `l [port]`
Unlock Port	Unlocks the port (or range of ports) specified by the Port property, or if non zero, the port specified in the command, so that a user may change to any enabled channel on that port. `u [port]`
Enable Power On a Port	Enables phantom power on the port (or range of ports) specified by the Port property, or if non zero, the port specified in the command. `j [port]`
Disable Port Power	Disables phantom power on the port (or range of ports) specified by the Port property, or if non zero, the port specified in the command. `k [port]`
Enable Channel	Allows the channel (or range) specified by the Channel property to be selected by the user at the ports specified by the Port property. If the channel or port values in the command are non zero then those values will be used instead. `e [channel] [port]`
Disable Channel	Prevents the channel (or range) specified by the Channel property (or the channel value in the command) from being selected by the user at the ports specified by the Port property. If the channel or port values in the command are non zero then those values will be used instead. `d [channel] [port]`
Query Channel	Queries a particular port (or range) or channel (or range) for relevant information. `q [port][channel]`
Query Current Channel	Queries a particular port for currently selected channel information. If the last requested channel is different to the current channel then either the port is locked or the requested channel is disabled. `@ [port]`

Command Line Commands (Cont.)	
Reset Controller	Resets the controller – reboots as though powered on `!`
Get Hub Identification / System Information	Displays version information for the TVM-1600 controller. `?`
Get Port Details	Displays port details and details of the device connected (resolution, polarity) `? [port no]`
Command Line Range Commands	Sets the Channel range for the TVM-1600. This property value may be used in subsequent action commands. A range may be specified using the min and max values, if max is equal to the min then a single value will be used. `s [min channel] [max channel]`
Set Port	Sets the Port range for the TVM-1600. This property value may be used in subsequent action commands. A range may be specified using the min and max values, if max is equal to the min then a single value will be used. `p [min port] [max port]`
Set TV System	Sets the system (for example, PAL I or NTSC) which the selected port (or range of ports specified in the Port property) will use. In most cases a single system is used for all ports on a TVM-1600, and if the port parameter is zero, all ports will be set with the same system. `t [system value]  [port` • TV System Value **1** = **PAL 1** • TV System Value **2** = **PAL B/G** • TV System Value **3** = **PAL D/K** • TV System Value **4** = **SECAM** • TV System Value **5** = **NTSC M** • TV System Value **6** = **NTSC N** • TV System Value **7** = **SECAM L**
Set Channel Frequency	Sets the frequency for a channel on a port (or range of ports). The frequency is specified in MHz as a decimal number e.g 643.25 `f [channel] [frequency] [port]`

Serial String Control

Overview

The TVM system has the ability to control display devices via RS232. With the proper setup at the TVM-RX03 a user can send serial strings to the display device.

To access the serial string toolbar;

1. Click again on the **control link** if the Messaging toolbar is displayed (FIG. 57). If the Messaging toolbar is not displayed, click the Control toolbar link until **Serial String** becomes visible (FIG. 57).

FIG. 57 Serial String control on the Status page

2. Type the **correct** serial string command which is to be issued to the display device attached to the RX, in the text box.
3. **Click** the port(s) checkbox to the right of screen you would like to send the string to
4. Click **Send to included**.

Appendix A– Endeleo IR Codes

Endeleo IR Codes

The following is a list of IR Codes used by Endeleo in learning serial or IR controls for display devices.

Note that several of the items in the following table are not represented in the *Action* drop-down menus for IR and Serial protocols (in the Web Configuration Interface).

For example, “AV SELECT 1" is available in the Action drop-down menu (see “A/V Sel”), and needs no custom code reference. However, a custom command like “AV SELECT 2" would be only be accessed by Custom 31, since this command is not represented in the *Action* drop-down menu options.

IR code	Description	IR code	Description
0-9	Keys 0 to 9	52	Cursor up *
10	Channel up *	53	Cursor down *
11	Channel down *	54	Cursor left *
12	Power Off	55	Cursor right *
13	Mute	56	Esc
14	Volume up	57	Info
15	Volume down	58	Help *
16	Program up	59	Teletext *
17	Program down	60	Services *
18	10+ key (for two digit channel entry)	61	Box office *
20	Channel restore (back) *	62	Interactive *
21	Power On	63	TV guide *
30	A/V select 1	64	Red *
31	A/V select 2 *	65	Green *
32	A/V select 3 *	66	Blue *
40	Device select (DVD/VCR) *	67	Yellow *
41	Enter *	70	Play
42	Clear *	71	Pause
44	TV Input *	72	Stop
45	TV Power *	73	Record
46	Live TV *	74	Fast forward
47	Thumbs up *	75	Rewind
48	Thumbs down *	76	Slow *
50	Menu	80	Select pass through *
51	Select Function	81	Cancel pass through *
		90 -99	Custom 1... through to Custom 10

An asterisk in the Description column for any IR Code in this table indicates that the command will require custom code (since the command is not represented in the Actions list.

Appendix B: ASCII Control Set

ASCII characters can be included in the serial string provided they are enclosed in brackets.

For example, Carriage Return <13>, Line Feed <10>.

ASCII Control Set											
Dec	**Hex**	**Char**	**Dec**	**Hex**	**Char**	**Dec**	**Hex**	**Char**	**Dec**	**Hex**	**Char**
1	1	SOH	41	29	)	81	51	Q	121	79	y
2	2	STX	42	2A	*	82	52	R	122	7A	z
3	3	ETX	43	2B	+	83	53	S	123	7B	{
4	4	EOT	44	2C	,	84	54	T	124	7C	|
5	5	ENQ	45	2D	-	85	55	U	125	7D	}
6	6	ACK	46	2E	.	86	56	V	126	7E	˜
7	7	BEL	47	2F	/	87	57	W	127	7F	
8	8	BS	48	30	0	88	58	X	128	80	€
9	9	HT	49	31	1	89	59	Y	129	81	
10	A	LF	50	32	2	90	5A	Z	130	82	‚
11	B	VT	51	33	3	91	5B	[	131	83	ƒ
12	C	FF	52	34	4	92	5C	\	132	84	"
13	D	CR	53	35	5	93	5D	]	133	85	…
14	E	SO	54	36	6	94	5E	^	134	86	†
15	F		55	37	7	95	5F	_	135	87	‡
16	10		56	38	8	96	60	’	136	88	~
17	11		57	39	9	97	61	a	137	89	‰
18	12		58	3A	:	98	62	b	138	8A	š
19	13		59	3B	;	99	63	c	139	8B	‹
20	14		60	3C	<	100	64	d	140	8C	Œ
21	15		61	3D	=	101	65	e	141	8D	
22	16		62	3E	>	102	66	f	142	8E	Ž
23	17		63	3F	?	103	67	g	143	8F	
24	18		64	40	@	104	68	h	144	90	
25	19		65	41	A	105	69	i	145	91	‘
26	1A		66	42	B	106	6A	j	146	92	’
27	1B		67	43	C	107	6B	k	147	93	“
28	1C		68	44	D	108	6C	l	148	94	”
29	1D		69	45	E	109	6D	m	149	95	•
30	1E		70	46	F	110	6E	n	150	96	-
31	1F		71	47	G	111	6F	o			
32	20	Space	72	48	H	112	70	p			
33	21	!	73	49	I	113	71	q			
34	22	"	74	4A	J	114	72	r			
35	23	#	75	4B	K	115	73	s			
36	24	$	76	4C	L	116	74	t			
37	25	%	77	4D	M	117	75	u			
38	26	&	78	4E	N	118	76	v			
39	27	’	79	4F	O	119	77	w			
40	28	(	80	50	P	120	78	x			

Appendix C: ASCII / Hex Conversion

Overview

Devices are typically controlled either using ascii text strings or using the HEX equivalent.

Control codes can be entered into the Endeleo hardware using ASCII, HEX or a combination of both. (Where certain ASCII codes are difficult to enter (e.g. carriage return).

Char	Hex		Char	Hex		Char	Hex		Char	Hex
(nul)	00		(sp)	20		@	40		`	60
(soh)	01		!	21		A	41		a	61
(stx)	02		"	22		B	42		b	62
(etx)	03		#	23		C	43		c	63
(eot)	04		$	24		D	44		d	64
(enq)	05		%	25		E	45		e	65
(ack)	06		&	26		F	46		f	66
(bel)	07		'	27		G	47		g	67
(bs)	08		(	28		H	48		h	68
(ht)	09		)	29		I	49		I	69
(nl)	0a		*	2a		J	4a		J	6a
(vt)	0b		+	2b		K	4b		k	6b
(np)	0c		,	2c		L	4c		l	6c
(cr)	0d		-	2d		M	4d		m	6d
(so)	0e		.	2e		N	4e		n	6e
(si)	0f		/	2f		O	4f		o	6f
(dle)	10		0	30		P	50		p	70
(dc1)	11		1	31		Q	51		q	71
(dc2)	12		2	32		R	52		r	72
(dc3)	13		3	33		S	53		s	73
(dc4)	14		4	34		T	54		T	74
(nak)	15		5	35		U	55		u	75
(syn)	16		6	36		V	56		v	76
(etb)	17		7	37		W	57		w	77
(can)	18		8	38		X	58		x	78
(em)	19		9	39		Y	59		y	79
(sub)	1a		:	3a		Z	5a		z	7a
(esc)	1b		;	3b		[	5b		{	7b
(fs)	1c		<	3c		\	5c		|	7c
(gs)	1d		=	3d		]	5d		}	7d
(rs)	1e		>	3e		^	5e		~	7e
(us)	1f		?	3f		_	5f		(del)	7f

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